Moving Test – MT680/MT681

Accuracy Class 0.1

MT680 – Single-phase Fully Automatic Test System with Integrated Current Source

MT681 – Three-phase Fully Automatic Test System with Integrated Current Source

ZERA

MT68x

General

The state of the art test systems MT680 (single-phase) and MT681 (three-phase) consist of a class 0.1 reference meter with built-in current source up to 100 A. They are particularly designed for analysis of complete metering installations and local mains conditions.
The equipment offers high functionality combined with an excellent menu guided operation via built-in soft-keys and colored 6.4" LCD-display.

Field of Application

- Verification of the load conditions on metering installations
- Verification of the energy registration
- Testing of meters with accuracy classes 1 and 2
- 4 Quadrant measurement *
- Frequency-, phase angle and power measurement
- Independent generation of load conditions by using incoming voltage from the grid
- Testing of 3 or 4 wire systems with pulse output *
- Harmonic spectrum analysis
- Wave form analysis
- Accuracy class 0.1

* only MT681

Also available with trolley (optional)

Functions

- User friendly menu guided operation
- Vector diagram display and phase sequence indication on integrated colour- screen
- Extendable compact flash memory for storage of customer data and measurement results
- Easy verification and analysis of meter installations
- No additional error for reactive measurements
- Automatic operation without need of an external PC

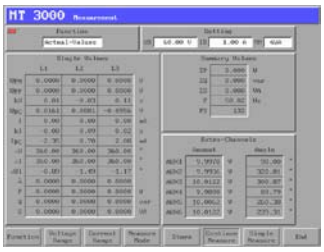
Data Management

For later download on a PC, the operator can store all test results and measuring values on a Compact-Flash-Memory-Card. The data management software MTVis provides the ability to transfer the data between MT680/MT681 and an external PC.
All test results can be summarized and printed in a test report by putting the compact-flash-memory card into an external PC.

Actual Value Measurement

All instantaneous values are simultaneously displayed.

- RMS values of voltage and current
- Phase angle between voltage and current
- Active, reactive and apparent power
- Test frequency
- Power factor

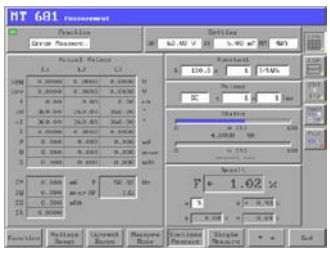


Vektorial Display

The coloured vector diagram display for voltage and current makes it very easy to detect wiring faults in voltage and current circuits.
All measured values can be stored on the Compact-Flash-Memory according to the customer information data.

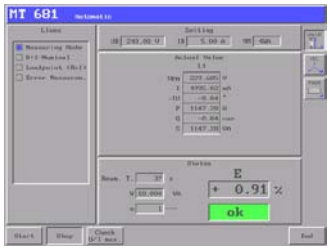
Error Measurement

By entering all relevant test parameters, like meter constant and the number of pulses, the system can perform the error measurement on electricity meters. The percentage error including all statistical values can be stored according to the customer information data. In order to inform the operator about the status of the measurement a bar graph indicates continuously the measured energy as well as the detected metrology pulses from the unit under test.



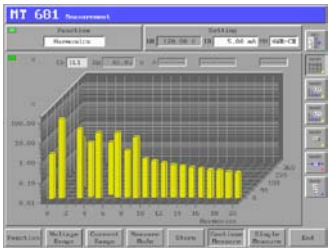
Automatic Operation

By using predefined test routines the MT680/MT681 system can operate automatically without need of an external PC.



Harmonic Measurement

Due to the high sampling rate of the working standard the MT680/MT681 is able to measure harmonics in voltage and current up to the 40th THD (conform to the voltage quality norm DIN EN 50160). The measured harmonic spectrum can be displayed in a chart or in a logarithmic diagram.



Technical Data

Portable Test System with integrated Current Source

MT680 MT681

General		
Power supply	85 … 265 V, 47 … 63 Hz	
Power consumption	max. 200 VA	max. 350 VA
Temperature range, operation	-10° … + 45° C	
Temperature range, storage	-15° … + 65° C	
Relative humidity (not condensing)	max. 95 %	
Dimensions (DxWxH)	192 x 485 x 392 mm	
Weight	~ 11.0 kg	~ 16.5 kg
Safety		
IP class according to DIN EN 60529	IP30	
Declaration of conformity	CE conform	
Protection class according to DIN EN 61140	I	
Overvoltage category voltage measurement	CAT III 300 V / CAT II 600 V	
Overvoltage category current measurement	CAT III 300 V / CAT II 600 V	
Reference meter		
Measuring modes	2LW / 2LBE / 2LS	2LW / 2LBE / 2LS 3LW / 3LBE / 3LS / 3LBKA / 3LBKB 4LW / 4LBE / 4 LS / 4LBK
Fundamental frequency	45 ... 65 Hz	
Bandwidth	3000 Hz	
Sampling	16 bit 504 samples/period	
Accuracy class for measuring of power / energy	0.1	
Angle measurement accuracy 3) 4)	< 0.015°	
Frequency measurement deviation	± 0.01 Hz	
Voltage Measurement		
Voltage measurement	100 mV ... 300 V	
Voltage range(s)	5 V, 250 V	
Voltage measurement accuracy 3) 5)	< 0.05 %	
Voltage measurement temperature drift 3)	< 15 x 10 E-6 / K	
Voltage measurement stability 1) 3)	< 50 x 10 E-6	
Voltage measurement long term stability 2) 3)	< 100 x 10 E-6 / year	
Current measurement		
Current measurement	1 mA ... 12 A [5 mA … 120 A]	
Current range(s)	10 A, 5 A, 2.5 A, 1 A, 0.5 A, 0.25 A, 0.1 A, 0.05 A [100 A, 50 A, 10 A, 5 A, 1 A, 0.5 A, 0.1 A, 0.05 A]	
Current measurement accuracy 5)	< 0.05 % @ 10 mA ... 12 A < 0.2 % @ 5 mA ... < 10 mA [< 0.15 % @ 500 mA … 120 A] [< 0.3 % @ 100 mA … < 500 mA]	
Current measurement temperature drift 4)	< 15 x 10 E-6 / K [< 50 x 10 E-6 / K]	
Current measurement stability 1) 4)	< 70 x 10 E-6 [<150 x 10 E-6]	
Current measurement long term stability 2) 4)	< 100 x 10 E-6 [< 600 x 10 E-6]	
Power Measurement		
Power/energy measurement accuracy 3) 4) 6)	< 0.1 % @ 10 mA … 12 A [< 0.2 % @ 500 mA … 120 A]	
Power/energy measurement temperature drift 3) 4)	< 30 x 10 E-6 / K [< 65 x 10 E-6]	
Power/energy measurement stability 1) 3) 4)	< 100 x 10 E-6 [< 200 x 10 E-6]	
Power/energy measurement long term stability 2) 3) 4)	< 100 x 10 E-6 / year [< 700 x 10 E-6 / year]	
Source		
Current min. max.	1 mA … 120 A	
Current range(s)	100 A, 50 A, 20 A, 10 A, 5 A, 2 A, 1 A, 0.5 A, 0.2 A, 0.1 A, 0.05 A, 0.02 A	
Current max. voltage per range	0.6 V (100 A .. 10 A), 2.7V (5 A), 8V (2 A .. 0.02 A)	
Current max. output power 8)	60 VA	
Current distortion	< 0.5 % @ 50 mA ... 120 A	
Current setting resolution	5 Digits	
Current stability 4) 9)	< 0.05 %	
Frequency range	45 … 65 Hz	
Phase angle setting range	0.00 … 359.99°	
Phase angle stability 4) 9)	< 0.15 °	

1: Stability over 1 hour (every minute one measurement with ti = 60 s)
2: Stability over 1 year (every month one measurement with ti = 60 s)
3: From 30 V … 300 V
4: From 10 mA … 12 A [500 mA … 120 A]
5: Related to the read value at optimum range selection
6: Related of apparent power
7: of range 30 % … 120 %
8: Related of end of maximum range and end of range and ohmic load
9: Stability over 1 hour (measurement with ti = 10 s)
[ ] ≙ with AC current clamps MT3430

Subject to alteration.

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